

We claim:

1 1. A computer implemented method of updating an interactive application broadcast
2 from a broadcast system to a reception device over a transmission medium, the method
3 comprising:

4 receiving at the broadcast system a broadcast signal including at least one record of a
5 first interactive application;

6 selecting a second interactive application, and broadcasting records of the second
7 interactive application to the reception device in place of at least some of the
8 records of the first interactive application, for execution of the second
9 interactive application by the reception device;

10 receiving at the broadcast system in the broadcast signal one or more additional
11 records of the first interactive application; and

12 broadcasting from the broadcast system selected ones of the additional records to the
13 reception device, for execution of the second interactive application in
14 conjunction with the additional records.

1 2. The method of claim 1, wherein the second interactive application is a customized
2 version of the first interactive application.

1 3. The method of claim 1, wherein the first interactive application is broadcast over a
2 first transport protocol, and the second interactive application is broadcast over a second
3 transport protocol.

1 4. The method of claim 1, wherein the first interactive application is broadcast over an
2 analog transport protocol, and the second interactive application is broadcast over a digital
3 transport protocol

1 5. The method of claim 4, wherein the analog transport protocol is the vertical blanking
2 interval of an analog broadcast television signal.

- 1 6. The method of claim 4, wherein the digital transport protocol is an MPEG signal.
- 1 7. The method of claim 4, wherein the digital transport protocol is an ATVEF signal.
- 1 8. The method of claim 4, wherein the digital transport protocol is an HTTP signal.
- 1 9. The method of claim 4, wherein broadcasting the additional records to the reception
2 device further comprises converting the updated records from a format compatible with the
3 analog transport protocol to a format compatible with the digital transport protocol.
- 1 10. The method of claim 1, wherein broadcasting selected updated additional records to
2 the reception device further comprises:
3 selecting an additional record that is an update of a corresponding record of the
4 second interactive application.
- 1 11. The method of claim 10, wherein selecting an additional record that is an update of a
2 corresponding record of the second interactive application further comprises:
3 storing for each record of the first interactive application a current sequence number;
4 determining whether a sequence number for a received additional record of the first
5 interactive application exceeds the current sequence number for the record;
6 and
7 responsive to the determination that the sequence number exceeds the stored sequence
8 number, selecting the additional record, and adjusting the stored sequence
9 number for the additional record to the received sequence number.
- 1 12. The method of claim 10, wherein selecting an additional record that is an update of a
2 corresponding record of the second interactive application further comprises:
3 storing for each record of the first interactive application a current sequence number;
4 determining for each additional record of the first interactive application whether the
5 record is an update by identifying an update flag;

6 for each additional record having an update flag, determining whether to utilize the
7 additional record by determining whether a sequence number for a received
8 additional record of the interactive application exceeds the current sequence
9 number for the record; and
10 responsive to the determination that the sequence number exceeds the stored sequence
11 number, adjusting the stored sequence number for the additional record to the
12 received sequence number.

1 13. The method of claim 1, wherein broadcasting a selected additional record to the
2 reception device further comprises:

3 broadcasting an updated additional record only if the additional record is compatible
4 with a corresponding record in the second interactive application.

1 14. The method of claim 1, wherein broadcasting the selected additional records to the
2 reception device further comprises:

3 determining whether the additional records are compatible with corresponding records
4 of the second interactive application by:

5 matching a first checksum of the non-content portions of the additional records of
6 the first interactive application with a first checksum on the non-content
7 portions of the corresponding records containing variable content.

1 15. The method of claim 14, wherein the non-content portions of the records include at
2 least one of the group consisting of:

3 record ID;
4 record type; and
5 record name.

1 16. The method of claim 14, wherein broadcasting the selected additional records to the
2 reception device further comprises:

3 matching a second checksum of static portions of records of the first interactive
4 application with a second checksum of static portions of records of the
5 second interactive application.

1 17. The method of claim 1, further comprising:

2 receiving at the broadcast system in the broadcast signal, control information for
3 controlling execution of the second interactive application at the reception
4 device; and

5 broadcasting the control information to the reception device.

1 18. A system for updating an interactive application broadcast from a broadcast system
2 to a reception device over a transmission medium, the system comprising:

3 a code detector adapted to receive a broadcast signal and identify codes in the signal
4 that relate to a change in a state of a first interactive application, and that
5 provides outputs signals indicative of the change of state;

6 a server that maintains state information for the first interactive application in
7 response to the output signals from the code detector, and in response to the
8 state of the first interactive application, outputs commands to start or stop the
9 output of updated records of the interactive application;

10 a code reader, adapted to read interactive application codes of an interactive
11 application and to identify records of the first interactive application that are
12 updates of corresponding records of a second interactive application stored in
13 a broadcast server, and communicatively coupled to the server, that selectively
14 provides the updated records to the broadcast server in response to the
15 commands from the server; and

16 a broadcast server that broadcasts the second interactive application to reception
17 devices for execution by the reception devices in place of the first interactive
18 application, and selectively broadcasts the updated records to the reception

19 devices, for execution of the second interactive application in conjunction
20 with the updated records.

1 19. The system of claim 18, wherein the code detector identify codes that relates to a
2 change in the state of an interactive application by detecting changes in an interactive application
3 identification code.

1 20. The system of claim 18, wherein the code detector identifies codes that relate to a
2 change in the state of an interactive application by detecting a new interactive application
3 identification code.

1 21. The system of claim 20, wherein the server in response to an output signal of the
2 code detector indicating a new interactive identification code, commands the code reader to start
3 providing updated records of the broadcast server.

1 22. The system of claim 18, wherein the code detector identifies codes that relate to a
2 change in the state of an interactive application by detecting an absence of an interactive
3 application identification code in the broadcast signal for a predetermined amount of time.

1 23. The system of claim 22, wherein the server in response to an output signal of the
2 code detector indicating an absence of the interactive identification code for the predetermined
3 time, commands the code reader to stop providing updated records of the second interactive
4 application to the broadcast server.

1 24. The system of claim 18, wherein the code reader caches updated records prior to
2 receiving a command from the server to provide the updated records to the broadcast server.

1 25. The system of claim 18, wherein the code detector detects commands for controlling
2 execution of the first interactive application in a preserved portion of the broadcast signal, and
3 the code reader provides the commands to the broadcast server for broadcasting to the reception
4 device.

1 26. The system of claim 18, wherein the second interactive application is a customized
2 version of the first interactive application.

1 27. The system of claim 18, wherein the first interactive application is received by the
2 code reader over a first transport protocol, and the second interactive application is broadcast
3 over a second transport protocol.

1 28. The system of claim 18, wherein the first interactive application is received by the
2 code reader over an analog transport protocol, and the second interactive application is broadcast
3 over a digital transport protocol.

1 29. The system of claim 28, wherein the analog transport protocol is the vertical blanking
2 interval of an analog broadcast television signal.

1 30. The system of claim 28, wherein the digital transport protocol is an MPEG signal.

1 31. The system of claim 28, wherein the digital transport protocol is an ATVEF signal.

1 32. The system of claim 28, wherein the digital transport protocol is an HTTP signal.

1 33. The system of claim 18, wherein the code reader converts the updated records from a
2 format compatible with the analog transport protocol to a format compatible with the digital
3 transport protocol.

1 34. The system of claim 18, wherein the code reader:
2 stores for each record of the first interactive application a current sequence number;
3 determines whether a sequence number for a received record of the first interactive
4 application exceeds the current sequence number for the record; and
5 responsive to determining that the sequence number exceeds the stored sequence
6 number, selects the record as an updated record, and adjusts the stored
7 sequence number for the record to the received sequence number.

1 35. The system of claim 18, wherein the code reader:

2 stores for each record of the first interactive application a current sequence number;
3 determines for each record of the first interactive application whether the record is an
4 update by identifying an update flag;
5 for each record having an update flag, determines whether to utilize the record by
6 determining whether a sequence number for a received record of the
7 interactive application exceeds the current sequence number for the record;
8 and
9 responsive to determining that the sequence number exceeds the stored sequence
10 number, adjusts the stored sequence number for the record to the received
11 sequence number.

1 36. The system of claim 18, wherein the content reader provides an updated record to the
2 broadcast server only if the record is compatible with a corresponding record in the second
3 interactive application.

1 37. The system of claim 36, wherein the content reader determines whether a record is
2 compatible with a corresponding record in the second interactive application by matching a first
3 checksum of the non-content portions of the records of the first interactive application with a first
4 checksum on the non-content portions of the corresponding records containing variable content.

1 38. The system of claim 37, wherein the non-content portions of the records include at
2 least one of the group consisting of:

3 record ID;
4 record type; and
5 record name.

1 39. The system of claim 37, wherein the content reader determines whether a record is
2 compatible by matching a second checksum of static portions of records of the first interactive

3 application with a second checksum of static portions of records of the second interactive
4 application.

1 40. A computer implemented method of updating a customized interactive application
2 broadcast from a broadcast system to a reception device over a transmission medium,
3 comprising:

4 receiving at the broadcast system a broadcast including at least one record of first
5 interactive application;

6 selecting a customized version of the first interactive application, and broadcasting
7 records of the customized version of the first interactive application to the
8 reception device in place of the records of the first interactive application;

9 receiving at the broadcast system additional records of the first interactive application;
10 and

11 responsive to determining that an additional record is an update of a corresponding
12 record of the customized interactive application, broadcasting the additional
13 record to the reception device, for execution of the customized application in
14 conjunction with the additional record.

1 41. A computer readable medium for updating an interactive application broadcast from
2 a broadcast system to a reception device over a transmission medium, the computer readable
3 medium coupled to a processor, for controlling the processor to perform the operations of:

4 receiving at the broadcast system a broadcast signal including at least one record of a
5 first interactive application;

6 selecting a second interactive application, and broadcasting records of the second
7 interactive application to the reception device in place of at least some of the
8 records of the first interactive application, for execution of the second
9 interactive application by the reception device;

10 receiving at the broadcast system in the broadcast signal one or more additional
11 records of the first interactive application; and

12 providing to a broadcast system selected ones of the additional records for broadcast
13 to the reception device, for the reception device to execute of the second
14 interactive application in conjunction with the additional records.
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